



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,776	10/20/2003	William D. Fisher	10981523-5	4544

7590 10/18/2007
AGILENT TECHNOLOGIES, INC.
Intellectual Property Administration
Legal Department, DL429
P.O. Box 7599
Loveland, CO 80537-0599

EXAMINER

GORDON, BRIAN R

ART UNIT	PAPER NUMBER
----------	--------------

1797

MAIL DATE	DELIVERY MODE
-----------	---------------

10/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/689,776	Applicant(s) FISHER ET AL.	
	Examiner Brian R. Gordon	Art Unit 1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8-3-07.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed August 03, 2007 have been fully considered but they are not persuasive. As to Bjornson et al. applicant asserts the displacing that occurs in the reference is passive rather than active. The argument is not commensurate in scope with that of the claims. Claim 1 only requires displacing the liquid. The claim does not specify or require the displacing of the liquid to result from any particular actuation or employment of any specific device.

Bjornson et al. disclose transfer element 622 is employed to transfer for force liquid from aperture.

As to the employment of a piezoelectric element, while it's well known in the art, piezoelectric material may provide for dispensing in two manners (1) deformation of the material and (2) vibrating the material that occurs at a higher frequency than the deformation.

As to Madden is silent to the device being deformable. The term deformable is interpreted mean the device is elastic, bendable, flexible. Madden discloses the plates are manufactured from somewhat elastic materials that include acrylics, polycarbonates, polypropylenes and polysulfones (column 12, lines 6-7).

As to claim 30, figure 6 shows vent 67. However it appears that the reference number is directed to a portion of the membrane and not a separate element. Where and in what structure is the vent located? How does the membrane cover the vent if the

vent is located in the membrane as suggested by the figure. It appears that the vent is nothing more than the opposite closed end of the open end of the well.

As to claim 30, Madden discloses a drip plate 16 with multiple wells, each having an open end 16c and an opposite vent hole covered by filter element 8a (permeable membrane, see figure 4). Applicant argues the device is employed with a negative pressure. The manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. While applicant intends for the instant invention to be employed for displacing liquid, there is nothing that precludes one from applying a negative pressure to the claimed structure as well.

As to applicant's arguments directed to Clark. The wells of Clark are disclosed as being plastic (inherently flexible, see column 1, line 23).

The membrane 16 covers the upper opening (vent) of each well. The upper opening is away from the opening as claimed as such the upper opening maybe considered vents.

For reasons given herein above, the previous rejections are maintained as given herein.

In view of applicant's amendment the previous rejection of claim 21 is hereby withdrawn.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

Art Unit: 1743

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 21-27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a deformable wall portion in the form of a plastic or elastic film, does not reasonably provide enablement for a device including a plastic or elastic film and a separate deformable wall portion. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. Applicant's specification discloses the deformable wall portion is a plastic or elastic film. The elements are the same structure not two separate elements as suggested by claims 24-26.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 21-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what side is covered with the plastic or elastic film and how the covering is related to the other claimed elements. To clarify such the examiner suggest amending the claim to read, "wherein said depot member is covered with on one side with a plastic or elastic film that covers the first end of each well."

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1-5, 10-14, 16-20 and 29 rejected under 35 U.S.C. 102(e) as being anticipated by Bjornson et al. US 6,284,113.

Bjornson et al. disclose once device 100 is attached to multiwell plate 54, the resulting apparatus 50 is inverted so that each of the apertures 30 fills with liquid. A meniscus 60 is formed at opening 34. Apparatus 50 is, for example, then positioned adjacent to an array of sample receiving reservoirs 142, which are part of microfluidic networks 108 in a microfluidic network plate 110 as depicted in FIG. 5. Each of the microfluidic networks 108 has an electrode 64 connected to an electrode 62 attached to transfer element 22. An electric potential is applied to the electroconductive material means of electrodes 62 and 64 causing a precise amount of liquid 58 in each of transfer elements 22 to be forced out of the transfer elements and into a corresponding sample receiving reservoir 142.

In the case of typical piezoelectric activation, picoliter to nanoliter droplets can be delivered at 1 kHz frequencies by cycling the deformation of a piezoelectric material via voltage modulation. Recent advances in high-frequency printing mechanisms have made it possible to deliver such droplets at 50 kHz frequencies by using a piezoelectric element to vibrate a microfabricated cantilevered beam with a tip that is in fluid communication with a liquid reservoir.

In another embodiment, as shown in FIG. 19, the present invention may be employed in conjunction with capillary size dispensing tubes 804 associated with the apertures 703 of the present devices. The capillary tubes are used to form small drops of fluid and locate them precisely on substrate surfaces 142 in miniature arrays. The printed arrays may consist of nucleic acids, peptides, immunoassay reagents, pharmaceutical test compounds and the like. As shown in FIG. 20, the array 900 of capillary dispensing tubes in fluid communication with the array of source wells may be used to locate the drops on a substrate in predetermined patterns. Nanoliter quantities of liquids may be dispensed. Arrays of biological samples as dense as approximately sixteen hundred per square centimeter with center to center spacing as small as about two hundred fifty micrometers may be formed (column 24, line 27+).

As to claims 29-30, it should be noted the portion of claim directed to the water is considered intended use for the water is not considered an element of the device. The portion directed thereto describes a desired use or intended use with water wherein the device is not excluded from being employed with any other fluid.

The structural requirements of claim 30 are a plurality of wells, each having an opening and a vent covered by a permeable membrane.

8. Claim 29-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Madden et al. US 6,783,732.

Madden et al. disclose a multiwell arrangement and in one embodiment, the vacuum pathways pass through the plane of the collection-tray upper surface by way of vents that traverse the collection tray proximate each of said collection wells (column 6,

line 35+). Also in this embodiment, the gas -permeable matrix covers the vents. The device includes openings 26.

9. Claim 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Clark, US 5,219,528.

Clark discloses a chamber having an opening on the upper side thereof facing the bottom surface of said middle plate, said chamber containing (1) at least one port extending through a surface thereof to permit a vacuum to be created within said chamber and (2) a microtiter plate containing a plurality of wells positioned within the chamber such that the ends of the cannulas extending beneath the bottom surface of the middle plate are located within said wells with the degree of extension within said wells of the microtiter plate being such that the ends of the cannulas are in close proximity and just above the bottom of the wells so that liquid deposited in said wells extends above the ends of the cannulas, said apparatus containing means for securing said three members together in vacuum tight relationship with a liquid permeable member placed between the top and middle plates, such that when a liquid is placed in the holes in the top plate and vacuum is created in the chamber, the liquid is drawn at a controlled rate directly through the membrane without lateral dispersion, through the cannulas in the middle plate and, in turn, into the chamber.

Claim Rejections - 35 USC § 103

10. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Art Unit: 1743

11. Claims 6-9 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson et al. as applied to claims 1-5, 10-14, 16-27 and 29 above, and further in view of Madden et al.

Bjornson et al. do not disclose employing a permeable membrane.

Madden et al. disclose a multiwell arrangement and in one embodiment, the vacuum pathways pass through the plane of the collection-tray upper surface by way of vents that traverse the collection tray proximate each of said collection wells (column 6, line 35+). Also in this embodiment, the gas -permeable matrix covers the vents.

It would have been obvious to one ordinary skill in the art to recognize that the device of Bjornson et al. maybe alternatively modified to incorporated the pneumatic device as taught by Madden et al. as an alternate means of transferring the liquid from the respective chambers.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bjornson et al. as applied to claims 1-5, 10-14, 16-27 and 29 above, and further in view of Churchill et al.

Bjornson et al. do not disclose employing a heat dispensing actuator.

Churchill et al. disclose those skilled in the art will recognize that other types of dispensers and valve actuation devices exist and may be used with efficacy. These may include, for example, but are not limited to piezoelectric dispensers, fluid impulse dispensers, heat actuated dispensers, air brush dispensers, and the like.

As such it would have been obvious to one ordinary skill in the art to recognize that the device of Bjornson et al. maybe alternatively modified to incorporated the heat actuators as taught by Churchill et al.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tseng et el., Little et al., Barth et al., Borrelli et al, Lancaster, and Hanaway et al. disclose fluid transfer devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/689,776

Page 10

Art Unit: 1743

A handwritten signature in black ink, appearing to read 'B. R. Gordon', with a stylized, flowing script.

Brian R Gordon
Primary Examiner
Art Unit 1743

brg

BRIAN R GORDON
PRIMARY EXAMINER